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# Erratum: A new look at the theory uncertainty of $\epsilon_K$

**Zoltan Ligeti**[a] **and Filippo Sala**[b]

[a] *Ernest Orlando Lawrence Berkeley National Laboratory, University of California, 1 Cyclotron Road, Berkeley, CA, 94720 U.S.A.*
[b] *LPTHE, CNRS, UMR 7589, 4 Place Jussieu, Paris, F-75252 France*

*E-mail:* zligeti@lbl.gov, fsala@lpthe.jussieu.fr

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We correct here a few typos, which only occured in the latex file of the paper, but not in our notes and calculations. Hence they do not affect any results in our paper.

- eq. (3.1) should be replaced by

$$|K^0\rangle \to |K^0\rangle' = e^{i\arg(\lambda_c)}|K^0\rangle, \qquad |\overline{K}^0\rangle \to |\overline{K}^0\rangle' = e^{-i\arg(\lambda_c)}|\overline{K}^0\rangle\,, \tag{3.1}$$

  eq. (3.11) should be replaced by

$$|K^0\rangle \to |K^0\rangle' = e^{i\,a\arg(\lambda_c)}|K^0\rangle, \qquad |\overline{K}^0\rangle \to |\overline{K}^0\rangle' = e^{-i\,a\arg(\lambda_c)}|\overline{K}^0\rangle\,. \tag{3.11}$$

- The signs in some $\lambda^2$ suppressed terms in the CKM expansions should be corrected: eq. (2.36) should be replaced by

$$\begin{aligned}\epsilon_K = {}& \kappa_\epsilon\, e^{i\phi_\epsilon}\, \widehat{C}_\epsilon\, |V_{cb}|^2\lambda^2\,\bar\eta \\ & \times \Big\{ |V_{cb}|^2\big[(1-\bar\rho) + \lambda^2(\bar\rho - \bar\rho^2 - \bar\eta^2)\big]\eta_{tt} S_0(x_t) + \eta_{ct} S_0(x_t, x_c) - \eta_{cc} x_c \Big\},\end{aligned} \tag{2.36}$$

  the second line of eq. (2.37) should be replaced by

$$\begin{aligned}\lambda_t = {}& -A^2\lambda^5\left[1 - \bar\rho - \frac{\lambda^2}{2}(1 - 3\bar\rho + 2\bar\rho^2 + 2\bar\eta^2) + \mathcal{O}(\lambda^4)\right] \\ & + i\bar\eta A^2\lambda^5\left[1 + \frac{\lambda^2}{2} + \mathcal{O}(\lambda^4)\right],\end{aligned} \tag{2.37}$$



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eq. (3.9) should be replaced by

$$\epsilon_K = \kappa'_\epsilon\, e^{i\phi_\epsilon}\, \widehat{C}_\epsilon\, |V_{cb}|^2 \lambda^2\, \bar{\eta} \times \Big\{ |V_{cb}|^2 \big[(1-\bar{\rho}) + \lambda^2(\bar{\rho} - \bar{\rho}^2 - \bar{\eta}^2)\big] \eta_{tt} S_0(x_t) + \eta_{ct} S_0(x_t, x_c) \Big\}, \tag{3.9}$$

and eq. (5.2) should be replaced by

$$\epsilon_K = \kappa'_\epsilon\, e^{i\phi_\epsilon}\, \widehat{C}_\epsilon\, |V_{cb}|^2 \lambda^2\, \bar{\eta} \times \Big\{ |V_{cb}|^2 \big[(1-\bar{\rho}) + \lambda^2(\bar{\rho} - \bar{\rho}^2 - \bar{\eta}^2)\big] \eta_{tt} S_0(x_t) + \eta_{ct} S_0(x_t, x_c) \Big\}. \tag{5.2}$$

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